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ABSTRACT

An instructional game is presented. The instructional goal of the game was to help the learner, one of the players, understand and use seven different prepositions with which, on the basis of a pretest, he was unfamiliar. The game was arranged so that instruction would occur simply as a result of communication to the learner from his partner who, acting as a tutor, already had the language skills to be taught. The tutor acted as the first player. The program was sequenced in terms of cards and in terms of the picture content. A criterion test was used and consisted of three parts. The first part asked the child to point to one of three pictures which showed particular spatial relationships. The second part of the test posed "Yes" or "No" questions. In the third part, the child was asked to describe pictures. The central problem of this pilot study was to test the effectiveness of this procedure with four-year-old children. The experiment was carried out in two different Head Start Centers. At one school, all testing and game-playing was carried out in an adjacent classroom; at the other, a van was used. The average improvement for the experimental learners was 3.5. Those playing with partners as naive as themselves showed an average gain of only .75. The use of a game format as a vehicle for instruction was found to be valuable, but the necessary arrangements and programming required a good deal of effort and supervision. It is recommended that a more informal context for peer tutoring be sought. (CK)

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A PEER TUTORING GAME FOR FOUR-YEAR-OLDS

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A PEER TUTORING GAME FOR FOUR-YEAR-OLDS[1]

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Introduction.

In recent years a good deal of interest has been expressed in peer-tutoring and a large number of publications have appeared in this area. This entire field has been reviewed by Garner, Kohler, & Riessman in their recent book, Children Teach Children: Learning by Teaching (1971a). In the British primary school, organized on a vertical basis with children from three different age levels in one class, the older children are expected to help initiate their younger classmates into the routines and procedures of the academic world.

Most of the efforts to formalize peer-tutoring have resulted in procedures whereby older children from higher grade levels are assigned to work with children in lower grades. Gartner et al. (1971b) reported that in their project elementary school children were tutored by high school youth. The younger children enjoyed the sessions but, over a five month period, gained an average of only six months, almost normal growth. It was the tutors who profited from the program; they showed an average gain of 3.4 years over the same five month period. Other investigators have reported favorable results in peer-tutoring. Frager & Stern (1970) and Lippitt & Lippitt (1970), for example, found real values in cross-age tutoring, and Allen (1967) reported on a successful project in which children were used as teachers of others.

Most of the research in tutoring by children has been focussed largely at the elementary school level. While few formal investigations of peer-tutoring have been carried out in the pre-school, and Head Start teacher can testify to the fact that children help each other both intentionally and unintentionally through their activities in the classroom. Feshbach & Devor (1969) studies the way children from two different class levels used rewards and punishments in teaching their peers. They found that lower-class children were more likely to use punitive methods of control although both groups used rewards to a considerable extent. Even young children seem to know something about good teaching methods!

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[1]The data for this study were collected by Susan Hart, with Christina Ramirez assisting.

The key to the use of four-year-old children as tutors lies in the appropriate preparation of materials. When children are learning alone, especially where language skills are to be acquired, it is difficult to do without an adult to supply auditory cues. Recording devices such as the language master have been employed (e.g., Bland & Keislar, 1966), but a pre-school child's peers constitute an excellent source of auditory prompting if the peer is acting as a tutor.

In an earlier study (Blumenfeld & Keislar, 1970) a matching game called "The Tell and Find Picture Game" was developed in which young children could tutor others in the use of prepositions. In the present study, an entirely new apparatus was designed and constructed. In addition, the instructional program was completely revised with improved orientation and sequencing. A similar technique had been used by Kielsmeier & Crawford (1969) at the teaching research center in Monmouth, Oregon. Here culturally deprived children learned to communicate more effectively with each other by naming aloud the objects to be identified by partners.

The Instructional Game.

The instructional goal of the game was to help the learner, one of the players, understand and use seven different prepositions with which, on the basis of a pretest, he was unfamiliar. The game was arranged so that instruction would occur simply as a result of communication to the learner from his partner who, acting as a "tutor", already had the language skills to be taught. From the players point of view, the goal of the game was to match pictures selected by one's partner. Instead of being a competitive game, therefore, the activity constituted a cooperative affair, each player depending on the other for their joint success.

The two players, tutor and pupil, sat opposite each other across a table. In front of each player was placed an upright panel, approximately 10 X 15 inches in size. On the panels were placed two cards containing six pictures, each picture appearing in identical form in a different position on the two cards. Each picture was approximately 2 X 3 inches in size while the cards were 8 X 12 inches. Beneath each picture was a large rectangular switch so that when the child pressed the correct picture, the nose of the clown was lighted to indicate a successful match. After the necessary orientation, the assistant activated the equipment and then was able to spend her time in monitoring the activity.

The tutor always acted as the first player. He began by selecting one of the pictures on his panel and pushing it so that the large switch was pressed and illuminated from underneath. The lighted picture then reminded the first player, or the tutor, which of the picture he had selected. The tutor then described the picture to the other player who was expected to identify and press the same picture on his own panel. When both players pressed the same picture they completed the matching task for that item. The first player then pressed a switch that turned off all lights and proceeded to select another picture. When all the pictures on the card had been matched the players placed a second card over each of the panels and the matching procedure began again.

The cards were carefully sequenced so that the subjects could easily identify the appropriate picture under increasingly complex circumstances as the game proceeded. On the first card only one picture was presented so that the learner could easily learn how to play the game. On subsequent cards during the first lesson pictures were added until, at the end of the session, as many as four pictures were presented at one time.

In later lessons this number was increased to six so that at the end of the entire program the child was selecting one picture out of a possible six.

A second way in which the program was sequenced was in terms of the picture content. At the beginning, the child was asked merely to distinguish among pictures, e.g. to select the picture of a cat rather than a picture of a ball or a table. But before long he had to select a cat on the table rather than a cat under the chair. This allowed a picture to act as a prompt, but this was finally faded until the child had to react solely to the preposition. He had to choose, for instance, between a dog <u>over</u> a swing, a dog <u>under</u> a swing, or a dog <u>behind</u> a swing. At the very end when six pictures were added, the task became exceedingly difficult: a dog was <u>over</u> the table, <u>under</u> the table, <u>next</u> to the table, <u>behind</u> the table, in <u>front</u> of the table, or <u>between</u> two tables.

<u>Criterion Test</u>.

The goal of the program was to have the child learr to identify and understand what was being said when a preposition was used, and to describe the picture appropriately by saying out loud the proper preposition. The criterion test, therefore, consisted of three parts. The first part, consisting of six items, asked the child to point to one of three pictures which showed particular spatial relationships, such as "Point to the clown on the fence." The distractors were, for example, a clown under a fence or a clown in from of the fence.

The second part of the test, consisting of seven items, posed "Yes" or "No" questions. In each item the child was shown a picture and asked, for example, "Is the clown on the fence?" Answers by the child were simply "Yes" or "No."

In the third part of the test the child was asked to describe pictures, the procedure being an adaption of an earlier test, the Parallel Sentence Production Test, a product of the Early Childhood Research Center. Each picture here contained the same two objects but in a different spatial relationship. For example, one item showed two pictures: a plane over the bridge and a plane under the bridge. The experimenter pointed to one picture and said, "This picture shows the plane under the bridge. What does this picture show?" The child was scored correct only if he used the appropriate preposition. The parallel feature of the posttest proved to be a highly effective way of prompting the child to describe the picture by using the preposition. Simply providing a picture for the child to describe is ineffective because children tend to describe parts of the picture without using the preposition which they may well know.

Problem for the Pilot Study.

The central problem of this pilot study was to test the effectiveness of this procedure with four-year-old children. The main concern, however, was with the effectiveness of the prompts supplied by a tutor. Consequently, the major hypothesis tested was that children can learn prepositional relationships from a same-age peer who knows these concepts, but not when both players are equally unfamiliar with prepositions. The question as to how much tutors learn was not explored because only those children in the experimental group were selected to be tutors who were already competent at the task.

General Design.

By means of a pretest on prepositions, three groups of children were selected: eight subjects with low scores to act as learners; four children with high scores to act as leaders of the experimental teams; and four with low scores to act as leaders of the control teams. Each of these eight teams played for four daily sessions and were then given the criterion test on prepositions as a posttest along with an activity preference test to determine how much they enjoyed the game.

Subjects.

The experiment was carried out in two different Head Start Centers. From a total group of 35 children who were given the pretest, four competent children with scores higher than 90% were selected, two from each school. These children played the role of leaders for the experimental teams. Since for the first two parts of the test the child had a 50% chance of being correct, only those children whose scores were less than 65% were selected. The children who received pretest scores between 65% and 90% did not participate in the experiment. Two of the six naive children in each school were randomly selected to be the leaders of the control and the remaining four were used as learners, two for the experimental and two for the control teams. Thus, there were eight teams in all, four experimental learners paired with competent leaders and four controls paired with naive leaders.

Procedure.

At one school, all testing and game-playing was carried out in an adjacent classroom; at the other, where space was not available, a van was used. Following the pretest and the selection of the subjects, the competent tutors were given preliminary training for approximately five minutes each so that they would describe the prepositional features of the pictures. This was done by using a parallel sentence production procedure. The child was shown two pictures similar to those on the pretest. The experimenter, pointing to the first picture, said, "Here is a ball under the table. What's this?" The child was expected to respond: "A ball over the table." All the seven prepositions were rehearsed in this fashion. Since the children already knew the prepositions they required little assistance in the review of this language skill.

Each team played the game on four successive days, each session lasting approximately ten minutes. An assistant brought the children from their classroom to the van or to the experimental room and then instructed the children to go ahead and play the matching game. If an error was made, the lights would go out for an interval of three seconds. This discouraged the children from adopting a trial-and-error procedure.

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Results.

In Figure 1 are presented the average error rates for the four children in the experimental group as compared with the four children in the control. The error rate over the four days, it will be seen, is less for the experimental group; there is a clear separation of the two groups in their performance during instruction.

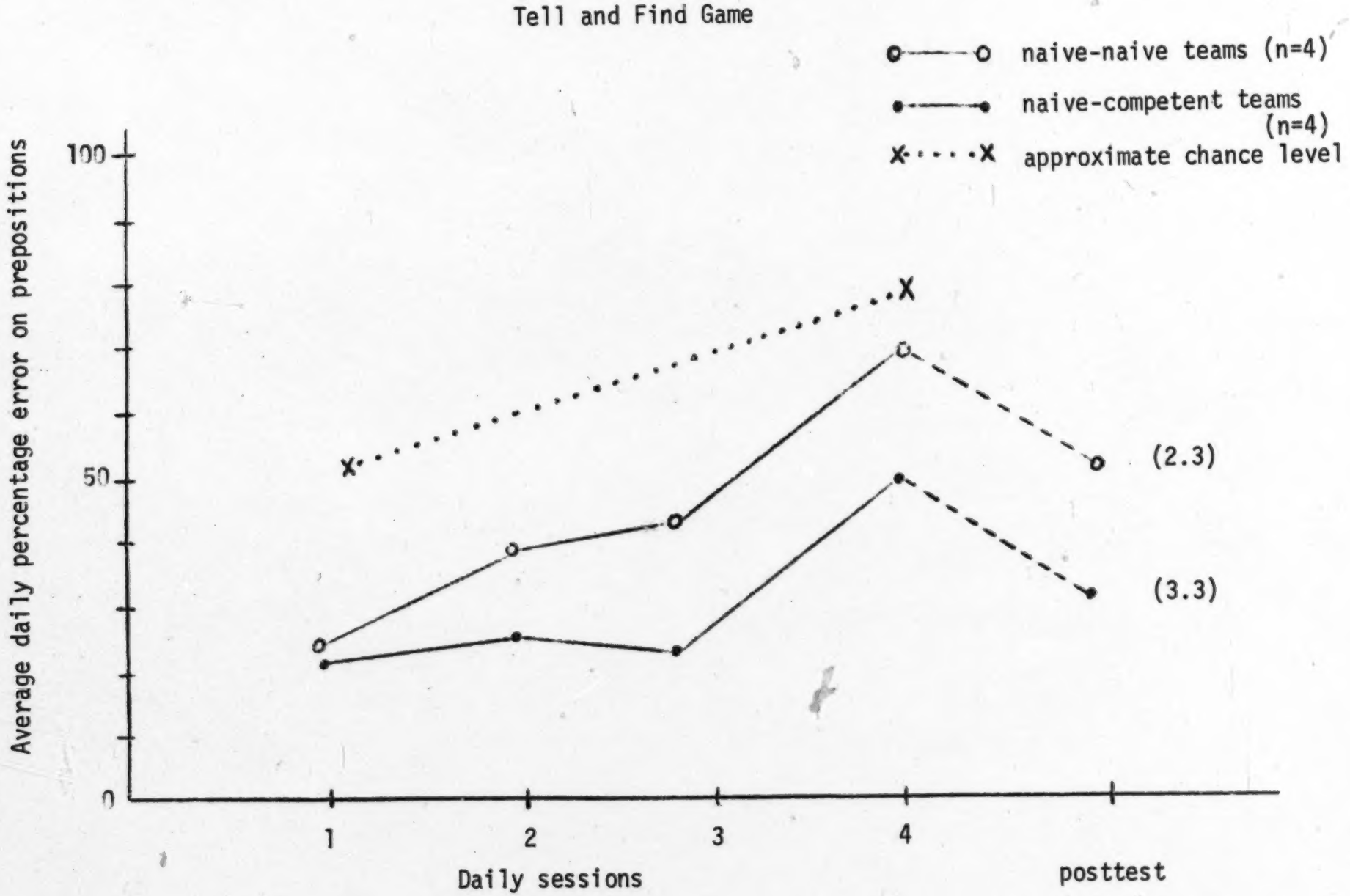

Figure 1. Error scores for eight naive subjects when playing with naive and competent partners on the Tell and Find Picture Game.

The data for the posttest scores are presented in Table 1. The average improvement for the experimental learners, that is, those who played with competent partners, was 3.5. Those playing with partners who were as naive as themselves showed an average gain of only .75. This difference using analysis of covariance, falls short of the .05 level, partly because of the small number of cases.

On the preference test, three-quarters of all the children indicated they enjoyed playing the game more than most of the common activities in school, such as listening to stories, painting, and block playing, etc. The mean score for the experimental group on the preference test was slightly, but not significantly, higher than the corresponding score for the control group, 3.3 versus 2.3. For the experimental group, three of the four children indicated that they enjoyed playing the game but it is of interest to note that the fourth child in this group placed the game at the very bottom of the list of choices. Furthermore, she neither enjoyed the game nor learned anything from it. Informal observations suggested that an unfortunate choice of tutor was responsible. This young boy was extremely impatient and domineering and constantly chided her for not knowing the prepositions and for "slowing things up."

Conclusion.

This pilot study has suggested that when children are appropriately matched they can indeed learn from competent peers within a reasonably short amount of time. However, there was no statistically significant finding between children tutored by competent children in comparison with naive peers. The lack of positive findings was attributable to one interesting exception: a team in which there was a personality clash between the tutor and the tutee. These results suggest that young children should be allowed to choose the peer from whom they wish to learn.

In the present study, the use of a game format as a vehicle for school instruction was most valuable, but the necessary arrangements and programming required a good deal of effort and supervision. To replace the rather cumbersome game format of the present study, it is suggested that a more informal context for peer tutoring be sought.

Table 1

Means and standard deviations of pretest, posttest and activity preference for experimental and control groups.

	Experimental (N=4)		Control (N=4)	
	M	S.D.	M	S.D.
Pretest	9.5	1.5	10.8	2.4
Posttest	6.0	2.5	10.0	.6
Preference	3.3	1.8	2.3	.7

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